

ABSTRACT OF THE DISCLOSURE

Supercapacitor cell electrode (13, 17) and separator (15) elements are fabricated from activated carbon fabric and membranes of microporous fibrillar ultra-high molecular weight polyethylene and are laminated with electrically conductive current collector elements (11, 19) to form a flexible, unitary supercapacitor structure (10). The micro-fibrillar laminar structure of the separator membrane material enables direct application of cell lamination temperatures without resulting collapse of separator microporosity and attendant loss of essential electrolyte retention and ionic conductivity. The superior functional materials enable the fabrication of flexible, self-supporting cell structures which yield improved specific energy capacity and increased voltage output for utilization demands.